

HOW I DO IT

Reconstruction of the Pelvic Floor Using Absorbable Mesh With a Bioresorbable Membrane (Seprafilm®) After Abdominoperineal Rectal Excision

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INTRODUCTION

Abdominoperineal resection (APR) is frequently performed in patients with advanced rectal carcinoma. After removing the rectum, the retroperitoneum sometimes cannot be closed by suturing. Many of these patients demonstrate perineal bulging with increase in abdominal pressure during coughing, straining, or a Valsalva maneuver. Perineal hernia develops because a large portion of the pelvic floor is removed by APR. The absent pelvic floor allows the small bowel to descend into the pelvis [1]. Several techniques have been suggested to reconstruct the pelvic floor [2]. Absorbable or nonabsorbable mesh is frequently used to divide the abdominal cavity from the anal lesion. Such pelvic reconstruction is very useful to minimize the complications in case of postoperative radiotherapy.

However, the use of mesh frequently results in postoperative adhesions between the small bowel and the new pelvic floor. We encountered 5 bowel obstructions after 18 pelvic reconstructions with mesh. We employed a new material, a sodium hyaluronate-based membrane, to prevent pelvic adhesions [3]. We report here our results using this new material.

PROCEDURE

The patients were positioned in the Lloyd-Davies position. After APR, the pelvic floor was reconstructed using a double layer of Vicryl mesh® (Ethicon, Somerville, NJ). The edges of the mesh were sutured to the edges of the pelvic outlet with interrupted sutures using 3-0 Vicryl. Posteriorly, the mesh was attached to the Waldeyer's fascia and sacral periosteum below the level of S₂. The edge of the mesh was sutured to the vagina or prostatic capsule anteriorly. Laterally, the fasciae of the pelvic side wall were used to anchor the mesh. The attachment of the

mesh was below the level of the ureter. A close suction drain was placed below the mesh to aid in obliteration of the space.

Before the abdomen was closed, an appropriate size of Seprafilm® (Genzyme, Cambridge, MA) was cut and applied between the pelvic floor and small bowel, and the midline incision (Fig. 1). Abdominal closure was performed in three layers.

RESULTS

We performed this procedure in three patients, two with advanced rectal carcinoma and one with pelvic recurrence after low anterior resection due to rectal carcinoma. No postoperative complications were observed after pelvic reconstruction.

Assessment of pelvic adhesions between the small bowel and mesh reconstruction was performed using an oral contrast study 3 months after treatment. As shown in Figure 2, the ileum moved upward according to the patients' position. We set a line from top of the pubic bone to the bottom of S₂ to calculate the amount of ileal movement (distance from H to P). The position of the patients changed from the standing position to the head-down position (20° from supine position). The mean distance of small-bowel movement was 2.4 cm (range, 2.2–2.5 cm). We could not observe movement of the small bowel from the pelvic floor in cases without Seprafilm®. These results suggested that Seprafilm® helps to avoid bowel adhesion to the mesh-reconstructed pelvic floor.

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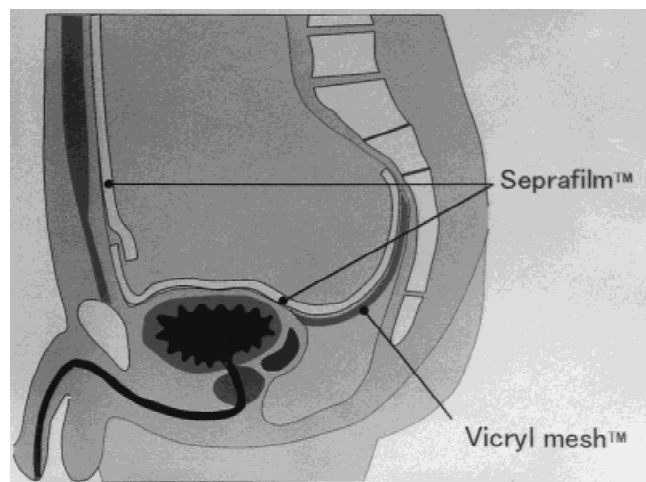


Fig. 1. Sagittal section of the pelvis with Vicryl mesh® in place. Seprafilm® is placed in the pelvis at the end of the operation.

DISCUSSION

Despite advances in surgical instrumentation and techniques, postoperative adhesion formation remains an important sequel in more than 90% of laparotomies [3,4]. These abnormal tissue attachments cause considerable morbidity following abdominal and gynecologic surgery, including intestinal obstruction and infertility. The economic burden of adhesion formation is also substantial. The costs of abdominal adhesiolysis is over 1 billion dollars per year in the United States [5]. Pelvic surgery, including gynecologic procedures, frequently causes intestinal obstruction.

Hyaluronic acid, as a tissue precoating solution, has been shown to protect tissue from injury and prevent adhesion development [6]. A bioresorbable membrane of hyaluronic acid has been developed to provide an ideal mechanical barrier for reducing adhesion formation. Seprafilm has been reported to prevent adhesion effectively after restorative proctocolectomy and myomectomy [3,7].

In this study, we examined the usefulness of Seprafilm® to prevent pelvic adhesions. We observed movement of the small bowel from the pelvic floor in the head-down position on the fluoroscopic monitor. However, small bowel was fixed to the pelvic floor in those cases in which Seprafilm® had not been used. This film is advantageous for patients who receive postoperative radiotherapy. Two of our patients received external beam radiotherapy after APR by the four-box technique. Adhesion of the small bowel to the pelvic floor is dangerous in such treatment. Our preliminary trial suggested that

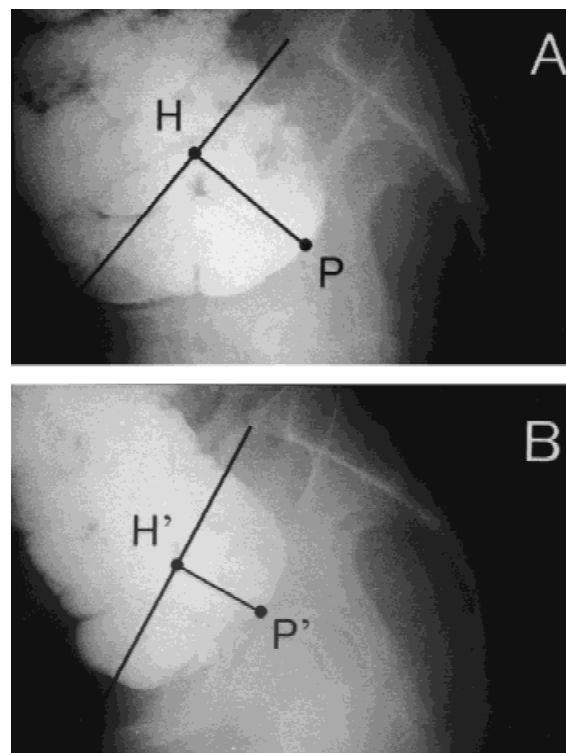


Fig. 2. Oral contrast study in the standing position. P(PT) is the lowest point of the bowel loop descending toward the perineum and H (H') is the foot of the perpendicular to the line from top of the pubic bone to the bottom of S₂ from Point P (P'). (A) Standing position. H-P: 6.6 cm. (B) Head-down position. This film was taken at 20° from the supine level. The ileum moves upward automatically. H'-P': 4.1 cm.

Seprafilm® was useful for pelvic reconstruction after APR.

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